

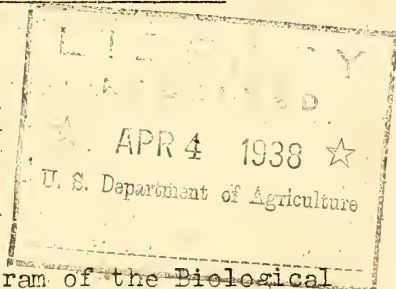
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THE WILDLIFE LAND-PURCHASE AND DEVELOPMENT PROGRAM

of the

U. S. BIOLOGICAL SURVEY



The land-purchase and development program of the Biological Survey, for restoring to wildlife a Nation-wide system of refuges, is based upon known facts regarding the needs of wildlife. These facts have been developed in the Bureau's studies during more than half a century of migratory waterfowl and of resident forms of wildlife, and in its studies of special aspects of certain colonial species. The program can be discussed according to these three phases.

Migratory Waterfowl Flyways

For many years the Bureau has been engaged in banding birds and then releasing them. The bands are returned whenever the birds are retaken, and on migratory waterfowl the Bureau ultimately gets back approximately one out of every four bands that are placed. On song birds the proportion is much lower. About two and three-quarter million birds have now been banded, and the returns have built up a massive volume of data to indicate clearly certain fundamentals in the behavior of many species, including migratory waterfowl. It is on these banding records and on the studies made by biologists over more than 50 years, of the breeding, wintering, and feeding grounds of these birds that the wildlife-restoration program is based. Such a program as that undertaken must be based on a knowledge of the continent-wide movements and needs of the birds. It is best explained by the use of maps.

Map No. 1 shows the flyways that have been worked out as a result of bird-banding studies. It will be noted that in the northern part of the continent many of the flyways overlap, but there are distinct migration lines within their boundaries. The Pacific flyway is clearly defined and overlaps only a narrow segment of the breeding grounds of birds from other flyways in northern British Columbia and the northern parts of Canada and Alaska. The Central flyway is relatively narrow and is used by the smallest number of birds. The Mississippi flyway originates in Alaska and eastward to the shore of Baffinland, and converging southward narrows into a funnel in Arkansas and Louisiana, through which the birds pass and spread out to winter along the Gulf coast of the United States. The Atlantic flyway draws from a wider territory but also narrows southward and restricts the birds in their winter range to a strip of country east of the

Appalachian Mountains and south of Long Island. Here the bulk of the birds drawn from the vast northern breeding grounds spend the winter.

Many curious things have developed out of these flyway studies. There is a growing appreciation of the fact that birds, after their habits are once formed, are rather fixed in their behavior. The same bird returns year after year to the same breeding ground as long as that breeding ground remains in satisfactory condition. The same bird may return year after year to the same wintering ground and traverse about the same territory in making the journey back and forth. There is a record of one banded mallard that returned for nine consecutive years to nest in approximately the same spot in western Nebraska. There are many other records of birds returning again and again to the same spot both to winter and to breed. Young birds show a tendency to scatter, and it is these youngsters that build up the new breeding grounds and populate newly restored areas, rather than the birds whose habits are already fixed. Thus it would be possible theoretically and probably actually to exterminate the birds in any flyway. If this should happen it would probably be a long time before that species of bird could be built back again to the point where there would be any noticeable flight.

A most interesting development has come from the birds banded in the great Bear River marshes. Here the Survey has had a banding station and has been banding birds for a number of years. The returns indicate that redheads from this particular marsh travel by three separate flyways and winter in three widely separated areas. Some travel westward to the Pacific and winter along the coasts of southern California and Baja California and in Mexico. The second group goes southeastward across the mountains down the Rio Grande and other rivers of Texas and winters on the Gulf coast about Corpus Christi and south into Mexico. The third group goes north and east from the Bear River marshes through the Great Lakes and follows them along to New York, thence down the Susquehanna and Delaware Rivers to the head of Chesapeake Bay, and winters from there to Currituck Sound in North Carolina.

Most of the ducks shot on the Atlantic coast are raised in the great prairie section of North Dakota, northern Minnesota, Montana, and the Prairie Provinces of Canada. Only a minor proportion comes from along the north Atlantic coast, and these are mostly black ducks and geese.

Need for Refuges in Various Regions

It is thus necessary, where the birds move the length of the continent in a single season, to provide nesting sites within their

breeding range, resting areas along the flyways so that they may find food and rest during their migration, and sufficient territory within the wintering range to see that they are provided for during the months of the year when they are crowded into the smallest quarters. These varying needs of the birds have divided our program into two rather sharply differentiated concepts, one involving water restoration and the other the provision of food and cover.

A glance at map No. 2 will show the original breeding ground of the waterfowl of North America and the present breeding ground on which the birds still nest in any considerable numbers. It will be noted that within the United States the present range covers parts of Washington, Oregon, Idaho, Montana, Wyoming, North and South Dakota, Nebraska, Minnesota, Michigan, and sections of other States to the south and east. These are the chief breeding grounds remaining in the United States, and even in these areas the ducks have decreased tremendously from their numbers of only a few years ago. Within these States and the northern parts of the States to the south, the Biological Survey is anxious to restore every waterfowl area where restoration is possible. At the present time within that region about 1,000,000 acres are in process of restoration. This acreage could be multiplied many times to the ultimate good of the birds, and it is important that every acre of water that can be put back should be so restored.

Water restoration, however, is not enough: cover and food also must be provided for the birds. This is done by fencing the areas to prevent the intrusion of livestock and the attendant destruction of cover and aquatic vegetation. Cattle, particularly in the more arid sections of the country, often wade into the water and actually eat the aquatic vegetation. What they do not eat they destroy by trampling so neither food nor cover of the proper kind is left available for the birds for nesting and rearing their young. Every pond, however small, is potential duck-nesting territory within the States mentioned. All the water restoration that can be done by any agency is potentially valuable for migratory waterfowl.

The Survey has been receiving a great deal of cooperation from various Federal agencies and from some State agencies in fencing these small water-restoration areas. The Soil Conservation Service has built hundreds of small reservoirs and ponds; the Forest Service and the Interior Department's Grazing Service have built others; and the Biological Survey itself has built a great many. Where these can be fenced and protected from livestock trampling, every one becomes a fine duck-nesting area, and every little pool produces one or more broods of birds. It seems to be a good practice to fence these ponds and allow the stock to drink from troughs or to fence lanes into the water, rather than needlessly to allow the destruction of vegetation as mentioned.

The Biological Survey is frankly interested in restoring any area, large or small, in these Northern States. Naturally the Bureau is interested in obtaining the larger drained areas and in restoring lakes and marshes that they may serve as refuges. It is also desirous of having the cooperation of all Government agencies in these efforts.

Need for Refuges on Wintering Grounds

South of the breeding areas the needs of wildlife are quite different. Map No. 3 shows the concentrated wintering grounds of the birds. It will be noted that in winter the great wild-fowl areas are reduced to their smallest size. At this time the duck population of the North American Continent is more concentrated than at any other time in its life cycle. Not only could it be more easily destroyed then, but at that season it is also in its most precarious state, because of the crowded conditions under which it has to exist. It is more open to attack by predators, both human and wild. Consequently the refuges on these wintering grounds that are indicated on this map should be of sufficient size to provide abundant food and cover for the birds during at least four months of the year.

The heavy black line across the map indicates the northern extreme of the wintering range of the migratory waterfowl, and the cross-hatched areas indicate the areas of concentration at this season of the year. The refuges along these areas should be of large extent and sufficient to take care of the potentially enormous concentration of waterfowl.

Minimum Essentials of the Program

Between this wintering ground and the tier of Northern States the refuges can be of smaller size but should be distributed along the main flight lines at reasonable intervals, so that as the birds move between the areas they will find refuges on which to feed and rest without being disturbed.

The Biological Survey regards this as the minimum that will insure the future of the migratory-waterfowl population of this country. It is figured that about 7,500,000 acres of marshland, properly distributed throughout the continental United States, would take care not only of the existing population of migratory waterfowl but a considerably increased population, and thus insure the return of a breeding stock to the northern nesting grounds sufficient to maintain the population. Beyond the 7,500,000 acres we have not been able to look. Should the population of migratory waterfowl greatly increase, additional acreage might be needed in the Southern States for wintering grounds, and of course adequate additional nesting grounds in the breeding territory are always desirable.

The existing national wildlife refuges fall into three general classes: (1) Waterfowl or general wildlife refuges; (2) big-game refuges, preserves, or ranges; and (3) special refuges, or rookeries, for colonial nongame birds.

Refuges for Waterfowl

Map No. 4 indicates the extent of the migratory-waterfowl refuge program. Those shown are refuges for which the land has been purchased and on which in most cases development is under way. The large solid dots are the largest refuges, known as super-refuges. The large circles, half filled, are primary refuges. Those quarter-filled are secondary refuges. The small black dots are easement refuges.

The easement refuges represent an interesting development in the Great Plains drought area. Here the Biological Survey has obtained permanent easements from the farmers, which give the Bureau the right to flood the land and maintain each area as a migratory-waterfowl refuge. In return for that the Survey does the work of restoring the water level and in most cases allows stock access to the water by one means or another. In North Dakota alone some 120,000 to 130,000 acres of land have been thus obtained, and the restoration of water levels is well under way there. The easement program has since been extended to other States. It is one way of enabling the Government to develop minor wildlife areas at low cost.

Map No. 5 shows the proposed migratory-waterfowl refuges with which the Survey is acquainted and in which the concentrations of birds are great enough to make the establishment of refuges desirable in this general region. With few exceptions, a refuge established in one of three or four suitable sites would provide adequately for the migratory-waterfowl population in that section. In only a few cases is the situation of the refuge absolutely fixed by natural conditions. It will be noted that there are still a few breeding areas that may be restored. The largest of these, and probably the most important, are the Horicon marshes in Wisconsin and the Kankakee marshes in Indiana. The greatest need for additional refuges still exists in the southern wintering areas along the Texas coast, in northern Louisiana, and along the Atlantic coast north to Delaware. The refuges shown on this map indicate an acquisition of approximately 2,000,000 acres of land to finish the minimum waterfowl program that it is felt will meet the needs of the birds.

Ranges for Big Game

Map No. 6 indicates existing big-game refuges, preserves, or ranges. Those named are in process of establishment or at least it is hoped that they are. Executive orders are in the Interior Department awaiting action on the principal three. Others indicate only in a

general way upland tracts that are needed to carry out the only idea the Survey has ever entertained regarding Federal responsibility for nonmigratory game--that is, to provide a Federal refuge for seed stock for every major North American wildlife species within its natural range. To do this, big-game areas are particularly needed in the East and South. With the addition of the three now under consideration and a few other areas in the West for more specialized purposes, the big-game situation there will be less urgent. In the Mississippi Valley there is still not a big-game refuge, and it is desirable that the native ecological types be protected by at least one or two refuges. This system of refuges represents the program the Biological Survey has outlined and explains the necessity of some plan for further acquisitions.

Rookeries for Colonial Nongame Birds

Refuges of the third type are the special sized kinds shown on map No. 7. These represent small islands or tracts of land set aside to protect great colonies, or rookeries, of nongame birds. The birds provided for by these refuges are herons, pelican, cormorants, murre, puffins, terns, gulls, and similar species. Some of these rookeries are immense bird cities, spectacular in the extreme. They have been set aside and are under Federal protection purely to preserve such species and for the safeguarding of their esthetic value to the people of the country. Most of them involve little or no acquisition of land and present no special problems other than that of patrol during the season when the birds are in the colony. These species are widely scattered over the country, except during the nesting season, and as most of the colony-nesting birds are water- and marsh-loving species, they will be adequately taken care of at other seasons by the proposed migratory-waterfowl system.

The Composite Refuge Picture

Map No. 8 is a composite showing of the entire land picture of refuges. These are the areas desired and regarded as a minimum essential for the wildlife protection and restoration program in this country. When this program is accomplished it seems quite certain that provision will have been made for the maintenance of at least a minimum breeding stock of migratory waterfowl and for the perpetuation, as far as can be provided, of all other species of big game and interesting upland species.

Typical Refuge Development

Map No. 9 shows a typical waterfowl development area, selected for the present purpose because it covers so wide a scope of interest and development. It is the development on the Souris River system in central

North Dakota, which comprises three great refuges. The Lower Souris begins at the Canadian line in Bottineau County and extends approximately 50 miles up the Souris River. This is being developed to form immense marshes to provide breeding grounds for the birds.

The Upper Souris, which lies just above the town of Minot on the upper part of the Souris River, has some great marshes, both in the lower and in the upper end of the area. Midway between these marshes is a huge storage dam that will hold approximately 112,000 acre feet of water. This dam insures a water supply not only to maintain the marshes below and the marshes in the Lower Souris refuge, but also to provide flood control for the city of Minot. It regulates the flow of water through the river channel so that the Souris River is now, except in extreme drought years, a living stream throughout the summer, and the city of Minot and other small towns along its course may have a fair stream of water running through their towns during the summer. The dam also provides water for a 6,000-acre irrigation project between the two units.

The Des Lacs refuge, on the Des Lacs River, is an additional protection to the city of Minot from any possible floods from that source. This has been developed in three units to store the water and create marshes favorable to the nesting waterfowl and for their use.

All three of these units are providing desirable sources of recreation. Swimming and boating are permitted where they do not interfere with the birds, and it is anticipated that as the years go by a considerable and increasing crop of fur will be available as a local source of revenue or for the maintenance of the refuge. Incidentally, some 600 tons of hay were cut on these refuges last year and delivered to local relief committees to help feed farm animals during the winter.

Method of Selecting Areas

Map No. 10 presents some idea of how the refuge areas are selected. This is a reconnaissance map on which was based the selection of the Back Bay Migratory Waterfowl Refuge in Virginia and North Carolina. The biologists who first went over it divided it into three possible areas, as shown on the map. The land valuation engineers then surveyed it, checked the area, and made a type map, which was used as a base for negotiations. Bureau engineers then studied the probable cost of development. Following this, conferences were held with the Virginia State Game Commission, and as a result of both the biological and the land-acquisition reports it was decided to purchase the central unit and develop it as a migratory-waterfowl refuge.

It is necessary to get the cooperation and interest of the State, because under the Migratory Bird Conservation Act some person named by

the Governor, usually a member of the game commission, is a member of the Migratory Bird Conservation Commission so far as voting on projects within his State is concerned. The project therefore is always worked out with the State game commission before any land is actually optioned and the case presented for the approval of the Migratory Bird Conservation Commission. Surveys similar to this have been made on areas already acquired and the areas still to be acquired under the waterfowl-restoration program.

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